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SEA SUPERIORITY WITHIN THE LITTORALS:

IS THE ENEMY BETTER PREPARED?

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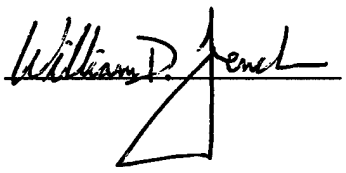
A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: 

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U.S. Navy doctrine demands sea superiority be established to support the projection of power from the sea to influence events ashore within the littoral regions of the world. It is unlikely that adversaries within the near future will be able to contest seriously control of the seas using conventional naval forces. Therefore, the U.S. Navy will likely encounter asymmetric threats from its future enemies. The international arms market has made technologically advanced sea denial weaponry available to many potential adversaries. When these weapons are integrated within a coordinated coastal defense system, they could place U.S. platforms assigned to conduct sea control operations at risk. This is of particular concern while the Navy is transitioning its primary focus from a blue water threat to littoral operations. This paper analyzes the modern littoral threats to U.S. sea control operations, accesses current U.S. vulnerabilities, and provides recommended options to mitigate adequately the threat in order to achieve local sea superiority.

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ABSTRACT FOR

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U.S. Navy doctrine demands sea superiority be established to support the projection of power from the sea to influence events ashore within the littoral regions of the world. It is unlikely that adversaries within the near future will be able to contest seriously control of the seas using conventional naval forces. Therefore, the U.S. Navy will likely encounter asymmetric threats from its future enemies. The international arms market has made available technologically advanced sea denial weaponry to many potential adversaries. When these weapons are integrated within a coordinated coastal defense system, they could place U.S. platforms assigned to conduct sea control operations at risk. This is of particular concern while the Navy is transitioning its primary focus from a blue water threat to littoral operations. This paper analyzes the modern littoral threats to U.S. sea control operations, accesses current U.S. vulnerabilities, and provides recommended options to mitigate adequately the threat in order to achieve local sea superiority.

INTRODUCTION

U.S. maritime strategy and doctrine have changed dramatically following the end of the Cold War. The Navy's focus shifted from a substantial blue water threat toward operations "from the sea" against numerous lesser enemies. The projection of power from the sea to influence events ashore within the littoral regions of the world clearly has become the mission of interest for U. S. naval forces and sea control operations are its foundation. These new concepts demand the United States exert its influence in the littoral regions of the world. They were delineated in the Navy's white papers "From the Sea," "Forward ...from the Sea," "Forward ... from the Sea: The Navy Operational Concept," and further expanded within the Marine Corps concept paper "Operational Maneuver from the Sea (OMFTS)." Several excerpts from these policy papers illustrate the Navy's need to establish sea superiority quickly within the littoral areas of a belligerent nation.

"Naval forces maneuver from the sea using their dominance of littoral areas to mass forces rapidly and generate high intensity precise offensive power at the time and location of their choosing." [1]

"The new direction for the Naval Service remains focused on our ability to project power from the sea in critical littoral regions of the world. ... Recent Department of the Navy budget decisions, which resulted in a real increase in spending on littoral warfare and the means for power projection, are illustrative of the shift in priorities we have undertaken since the publication of ...From the Sea." [2]

"Initial operations by forward naval forces are critical for enabling the joint campaign. ... Our ability to dominate the littorals, including the undersea environment, allows us to operate with impunity in the face of enemy denial threats while taking initial action to defeat those threats and prepare the battlespace for follow-on forces." [3]

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[1] Navy Department, "... From the Sea," Washington D.C. 1992, 8.
[2] Navy Department, "Forward from the Sea," Washington, D.C. 1994, 8.
[3] Jay L. Johnson (ADM., USN), "Forward ... from the Sea: The Navy Operational Concept," Washington, D.C. 1997, 7.

In addition, Marine Corps doctrine clearly delineates that sea superiority is a prerequisite for its operations.

"What distinguishes OMFTS from all other species of operational maneuver is the extensive use of the sea as a means of gaining advantage, an avenue for friendly movement that is simultaneously a barrier to the enemy and a means of avoiding disadvantageous engagements." [4]

Following from the littoral concepts discussed above, U.S. naval doctrine clearly identifies the challenge: "Success in engagements at sea demands preparation to counter an adversary's gunfire, missiles, torpedoes, and mines." [5] The implications of this simple statement are enormous because such engagements are not to be conducted within the relatively uncluttered blue water domain. Rather, they are to occur within a highly complex brown and green water environment where an astute enemy may be expected to employ his assets in an integrated, asymmetric manner. Therefore, the purpose of this paper is to analyze briefly the nature of modern littoral threats to U.S. sea control operations, identify U.S. vulnerabilities in dealing with these threats, and recommend methods for compensating.

LITTORAL THREAT ANALYSIS

As the U.S. Navy has shifted its operational focus towards the littorals, its forces operating in this region have become susceptible to additional threats beyond those prevalent in a deep, blue water environment. This section evaluates the individual asymmetric threats that include naval mines, submarines, anti-ship missiles, and small craft. The last part of the analysis focuses on the advantages gained by an adversary who combines two or more of these weapons systems into an integrated coastal defense.

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[4] Navy Department, "Operational Maneuver from the Sea," Washington, D.C. Headquarters, U.S. Marine Corps, 14 April 1995, 5.

[5] Navy Department, Naval Warfare, (Naval Doctrine Publication 1) (Washington, D.C. 1994), 29.

Naval Mines

There are currently thirty countries actively involved in the development and manufacture of sophisticated naval mines. At least fifty countries have mine-laying capabilities and access to significant naval mine inventories. Several of these countries including Iran, North Korea, China, and Russia, have large stockpiles of mines and fleets of mine-laying capable platforms.[6] The Director of Expeditionary Warfare, MGEN Edward Hanlon, Jr., USMC, summarized the future naval mine threat:

"Mines are quickly becoming the weapons of choice for many countries realizing, quite correctly, there is no point in trying to beat the U.S. Navy at its own game. For that reason, naval expeditionary forces can reasonably expect the already considerable problems created by naval mines to get worse long before they get better." [7]

A review of two historical mining scenarios will illustrate the deleterious effect mines can have on the local control of the sea. The first example occurred during the Korean War. Following a very successful amphibious operation at Inchon, the Navy was stymied by the deployment of 3000 mines off the coast of Wonson, the next landing target. The minefield delayed the scheduled U.S. amphibious landing by more than a week. RADM Allen E. Smith, commander of the amphibious force, summarized his frustrations in the following quote that he included in a message to the CNO. "We have lost command of the sea to a nation without a navy, using weapons that were obsolete in WWI and laid by vessels that were utilized at the time of the birth of Jesus Christ."[8]

In light of the significant challenges faced by the U.S. Navy clearing naval mines at Wonson, it is valuable to consider the impact naval mines might have had at Inchon. Following the Inchon landing, U.S. Marines found unassembled Russian mines on Wolmi-do, an island within Inchon harbor. If the North Koreans had laid those mines, they would

[6] Jeanne Avery, "The Naval Mine Threat to U.S. Surface Forces," Surface Warfare, May/June 1998, 6.
[7] Edward Hanlon Jr. (MGEN., USMC), "Think or Sink—21st Century Mine Warfare," Surface Warfare, May/June 1998, 2.

have altered the operational tempo and possibly delayed the U.S. landing to a point where the tides would have precluded an amphibious operation in time to support the UN troops approaching from the south.[9]

A more recent mining operation that precluded the U.S. Navy from conducting a power projection operation occurred during the 1991 Gulf War. Iraq laid approximately 1300 mines in the northern Persian Gulf off the coast of Kuwait. The United States was aware that Iraq was mining the northern Arabian Gulf but failed to either interdict to prevent the mining operations or conduct adequate surveillance to accurately locate the mines. The original operational plan in support of Operation Desert Storm included the clearance of a channel and staging area to support an amphibious landing near Ash Shuaybah in Kuwait. The estimated clearance times were as high as forty days. The amphibious landing was cancelled. Mine counter-measure (MCM) plans were subsequently revised to clear a much smaller area to support a raid on Faylaka Island. The starting point for MCM operations was determined based on limited intelligence and broad assumptions about Iraqi mining doctrine. Consequently, the geographical extent of the Iraqi minefield was underestimated and mines struck two U.S. warships.

In short, Iraq's mine laying effort of about 1300 mines, a relatively minor endeavor compared to over 700,000 mines deployed during WWII, was successful in severely damaging two U.S. frontline warships and precluding an amphibious operation. General Schwarzkopf stated:

"I'd cancelled the Navy's amphibious assault on Faylakah Island. Plans called for it to proceed the ground war by two days, but the helicopter Carrier USS Tripoli and the Aegis guided missile cruiser USS Princeton had struck mines, U.S. and British minesweepers had

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[8] Naval Doctrine Command, "Maneuver Warfare and Mine Countermeasures," Surface Warfare, May/June 1998, 29.

[9] Theodore, L. Gatchel, At the Water's Edge (Annapolis, MD:Naval Institute Press 1996), 179.

been unable to clear the area, and as a result the Navy hadn't made it into position to launch the attack in time." [10]

Technological developments in the production of modern mines have complicated countermeasures significantly. Old-fashioned minesweeping techniques are no longer adequate. The only method that is effective against these new types of mines is minehunting, where each mine must be located individually and destroyed by divers or remotely controlled vehicles. The advent of stealth mine designs that include anechoic coatings, nonferrous materials, and unconventional stealth like shapes make these operations extremely challenging, particularly against bottom mines. These operations are extremely time consuming, and require well-trained individuals with expensive, state of the art equipment.

Mines remain popular because they are an inexpensive way to control the tempo of naval operations, particularly against an adversary with multimillion-dollar weapons systems. Mined waters limit the mobility of surface warships and amphibious assault vessels, and in most scenarios require them to wait for dedicated MCM forces to arrive and clear the suspected area. The price for this waiting is a critical loss in the operational factor time that can never be regained. During this period, dangers from enemy diesel submarines, anti-ship cruise missiles, and small craft also are increased.

Submarines

A large number of navies operate diesel submarines. Today, there are 44 nations with submarines.[11] Shallow water, complex acoustic conditions, and irregular bottom topography found within the littorals make undersea warfare (USW) extremely difficult. These areas are ideal for diesel submarines to interdict U.S. warships or logistic ships

[10] Peter Petre, Schwarzkopf - It Doesn't Take a Hero - The Autobiography (Annapolis, MD: Naval Institute Press, 1992), 446.
[11] Anthony Watts, Jane's Underwater Warfare Systems 1998-1999 (Surrey, UK: Sentinal House 1998), 10.

transporting supplies into the theater to support U.S. and allied operations. Technological improvements have advanced the quality of modern conventional submarines. They continue to improve in the area of quieting. Their communications and sensor suits can be updated with state of the art components. Their primary weapon system remains the torpedo, but wire-guidance, acoustic and wake homing capabilities, and ranges in excess of ten nautical miles make them very credible threats.[12]

The most significant advancement in recent conventional submarine design is the introduction of the air-independent propulsion (AIP) system. This system allows a submarine to conduct low speed operations for more than ten days without having to snorkel.[13] It has resolved one of the major disadvantages conventional submarines suffer when compared to nuclear powered submarines. There are already several submarine AIP producers. The Swedish Submarine Force has four boats currently operating with AIP. The Germans are scheduled to have their first AIP submarine, the Type U212, operational by 2000. Based on Germany's historical propensity to export diesel submarines, it is very conceivable that many Third World countries could have these highly capable platforms within their military arsenals during the next decade.

It is well understood that the British submarine, HMS Conqueror, had a strategic impact on the course of the Falklands War by sinking the Argentine heavy cruiser General Belgrano. For the remainder of the war, the Argentine Navy remained essentially within its coastal waters and was never a factor in the conflict. The exception was another submarine that operated during this conflict and received little notoriety, the San Luis, an Argentine diesel submarine. The San Luis patrolled throughout the British-claimed total

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[12] K. T. Madsen, "Fighting the Beast," U.S. Naval Institute Proceedings, August 1996, 28.
[13] Frank Rosenius, "Battling Battery Boats," U.S. Naval Institute Proceedings, August 1997, 22.

exclusion area (TEZ) at a great distance from the Argentine coastline. San Luis was successful on three separate occasions in penetrating undetected into the middle of the British naval task force. On all three occasions, she launched torpedoes that failed to explode. After the war, the torpedo malfunctions were discovered to be operator error.[14]

If the San Luis had been able to sink just one British warship, she would have dramatically altered British plans and timelines. A single antiquated diesel submarine operating several hundred nautical miles from its base could have become the force multiplier that completely reoriented the operational factor space, reclaimed the operational tempo, and redefined the outcome of the conflict. The credibility associated with one successful torpedo explosion likely might have dictated the subsequent operations of a far superior naval power. This alternative was at least considered by Admiral Sandy Woodward, the commander of the British task force, who stated: "Lose Invincible and the operation is severely jeopardized, lose Hermes and the operation is over. One unlucky torpedo, bomb, or missile hit could do it." [15]

In contrast to the Falklands, the United States took a far more proactive stance when faced with the threat of Foxtrot submarines in the 1986 conflict with Libya. Imbedded within the operational plan was a contingency to eliminate any enemy submarines that attempted to get underway. The task force commander of the three-carrier battle group, RADM David Jeremiah, stated: "My biggest worry was the ability of the Foxtrot submarine to conduct a successful attack on one of the carriers."[16] The United States was properly postured to take appropriate preemptive actions in order to ensure local sea superiority.

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[14] James Fitzgerald, "There is a Sub Threat," U.S. Naval Institute Proceedings, August 1990, 57-63.
[15] Sandy Woodward, One Hundred Days: The Memoirs of the Falklands Battle Group Commander (Annapolis, MD: Naval Institute Press, 1992), 99.

In summary, the conventional submarine operating near its coastline has the "home-court advantage." These submarine crews understand how to exploit the environment. Many of these submarines are designed to operate on the bottom and hide. A patient, modern conventional submarine, with reasonably advanced sonar systems optimized for littoral operation and an inventory of homing torpedoes, is a very lethal threat. The littorals remain a haven for the submarine.

Anti-Ship Missiles

Third World countries may deploy anti-ship missiles from fast patrol boats or coastal missile batteries. The modern fast patrol boat is very capable with elaborate sensors and communication systems. It can provide the same surface warfare (SUW) threat as either a frigate or destroyer. These boats are fast and some have been equipped with stealth features, making them difficult to target.

Today, about thirty countries have coastal gun batteries, missile batteries, or a combination of both.[17] They can obtain their targeting data from a multitude of sources: naval craft, aircraft, or their own sensors, such as radar or ESM. More importantly, they might not even attempt to identify or validate a contact prior to engaging. This type of aggressive tactic, requiring little or no target discrimination, was employed during the Iran-Iraq War. The USS Stark was misidentified as an oil tanker and was struck by two Iraqi Exocet missiles.

Any country with shipborne anti-surface missiles can convert the missiles to be fired from mobile launchers ashore with limited effort. The Argentines did this successfully during the Falklands War by mounting an Exocet missile on a mobile trailer. They waited

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[16] Armed Forces Staff College, The Joint Staff Officers Guide-1991 (AFCS Publication 1) (Norfolk, VA: May 1992), III-33.
[17] Massimo Annati, "Coastal Defense: Issues and Solutions," Military Technology, February 1995, 26.

until the British destroyer, HMS Glamorgan, approached within range and launched their only missile allocated for use from a shore battery. The single Exocet missile hit the HMS Glamorgan and caused extensive damage. The implications of this threat to the British amphibious landing objective could have been substantial had the Argentines more than just five Exocet missiles in their entire inventory.

Small Craft

The advent and proliferation of remotely piloted aircraft provides another viable weapons delivery platform optimized for employment within the littorals. This concept of using remotely operated vessels can be extended to include surface craft. Small sized, stealthy platforms with relatively high speeds for their expected short engagements ranges would make them an attractive option, particularly when employed in a discriminating manner against high value targets.

Loaded with only fuel and munitions, expendable planes or small surface craft could allow a modern nation to gain the benefits realized by the Japanese Kamikazes without the obvious motivational challenges. Kamikazes caused significant damage to the U.S. fleet, and were responsible for killing nearly 5000 U.S. Sailors. Professor T. L. Gatchel succinctly summarized the potential operational impact of the Kamikazes:

"Developed as a last-ditch measure, the special attack weapons, if used as part of a naval defense concept, showed the greatest potential of all Japanese attempts actually to defeat an American landing. Fortunately, the Japanese initiated this form of warfare too late in the war to develop the concept fully. ... suicide tactics were a measure of desperation, but the results obtained were considerable and, had they been much greater, might have caused us to withdraw or modify our strategic plans."[18]

Integrated Littoral Defense

The problem that U.S. Navy leaders must understand and be ready to combat is not the individual asymmetric threats an adversary may possess, but the cumulative effect that

[18] Gatchel, 172.

results from integrating mines, submarines, small craft, and anti-ship missile assets into a coordinated littoral defense. Numerous different methodologies can be used to achieve an integrated defense. For example, during the 1915 Dardanelles campaign, the Allies were rebuffed by a relatively unsophisticated but integrated Turkish coastal defense. With very limited assets, the Turkish soldiers were successful in defending the Dardanelles with a minefield containing only 343 naval mines, fixed guns in forts, and mobile artillery. The Turkish coastal defense inflicted heavy losses on the British and French navies. Six battleships were lost, four to mines and two to gunfire, within a single day. More importantly, the successful defense of the Dardanelles resulted in Britain's decision to pursue a land campaign against Gallipoli that subsequently ended with disastrous results.

Today, there are a significant number of countries that have developed or procured multiple weapon systems for coastal defense, and are committed to a naval operational concept focused on delay, denial, disruption, and demoralization (D4). Modern naval D4 operations rely on stealth, surprise and political leverage, which make them very similar to guerrilla warfare on land. D4 operations may need only to increase incrementally the amount of resistance against an attacking naval force to be successful. U.S. public perception of a stalemate, high U.S. casualties, or significant material costs might preclude a victory that had been considered certain in strictly a military context. Therefore, modern U.S. offensive naval operations against D4 adversaries must be characterized by speed, quantifiable progress, and as few casualties as possible.[19]

Iran provides one example of a country well positioned to conduct D4 operations. Iran's three Kilo Class submarines, combined with a proven naval mining capability, provides a significant USW and SUW threat. The Iranians have numerous shore missile

[19] Robert C. Rubel (Captain, USN), Naval Operational Concepts, Unpublished Paper, U.S. Naval War College, 1998, 3.

batteries with Chinese-built Seersucker missiles that cover the entire Strait of Hormuz, as well as areas within the Arabian Gulf and Gulf of Oman. They have Chinese Houdong Class fast missile boats with C802 anti-ship missiles. In addition, they can engage aircraft with both U.S. and Russian-made surface to air missiles placed both on the mainland and on several Iranian-controlled islands within the Arabian Gulf. This coordinated defense would allow Iran's naval forces to operate under a protective umbrella provided by shore based missiles. It would also require that any MCM or USW operations attempted by an adversary be conducted under the constant threat of anti-ship missiles from the shore or from a fleet of fast missile boats.

Iran is not unique. Two other potential adversaries, North Korea and China both have large inventories of mines, submarines, and missile systems that are available for deployment as part of a coordinated littoral defense system.

Although Norway is not expected to be a U.S. adversary, it is instructive to see the sophistication and capability of its integrated coastal defense system. It consists of a series of fortresses with cable-controllable minefields, fortified torpedo batteries, and artillery installations, all linked together with integrated tactical radio communications, a digital telephone system, and an integrated alarm system.[20] Whether these systems will be made available for export is unknown. However, reduced U.S. and other Western military budgets have influenced the sale and proliferation of modern weapons to other countries. It is only reasonable to expect Third World nations to purchase improved state of the art defense systems from any country willing to realize revenue from foreign arms sales.

The key operational implication of the foregoing threat discussion is that an adversary who astutely employs an integrated littoral defense can influence quite effectively in his

[20]Watts, 290.

favor the factors space and time in the littoral environment, even with a decided disadvantage in factor force. If the United States allows an adversary to deploy its mines and submarines without accurate locating data, the amount of space controlled by the enemy could be staggering. The enemy could claim enormous areas well beyond that which was actually mined or patrolled by submarines. This 'virtual threat' may work just as effectively as actually seeding the area with defensive weapons. An adversary's ability to control the operational factor space could significantly impede a primary axis of the U.S. offensive, allowing the adversary to gain leverage and possibly take control of the operational factor time. Any delay that an adversary creates in a U.S. advance could be exploited to his benefit. It might allow him the opportunity to gain allies, mobilize additional troops, improve defensive positions ashore, obtain diplomatic support from international organizations such as the UN, or allow U.S. popular opinion for the operation to wane. The longer the delay, the more likely an adversary can use it to his advantage. Clausewitz may have expressed this best in the following quote: "It is the fact that time which is allowed to pass unused accumulates to the credit of the defender."[21]

U.S. VULNERABILITY AND METHODS TO COMPENSATE

With the above in mind, the following subsections address the U.S. window of vulnerability to littoral threats, and recommended compensations for minimizing this vulnerability.

Window of Vulnerability

Doctrinal guidance advocates a four-step systems approach for MCM operations. These steps consist of prevention, avoidance, clearance, and pressing on with operations. Prevention requires the destruction or degradation of the enemy's ability to lay mines.

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[21] Carl Von Clausewitz, On War (Princeton, NJ: Princeton University Press, 1976), 357.

Avoidance is often achievable if accurate locating information is available for the enemy's minefields. Mine clearance will be required if either prevention or avoidance cannot be achieved. At some point, the decision to press on without having eliminated all the risks will have to be made.

In order for the U.S. Navy to have a credible mine clearance capability, it must move beyond its historical brute force MCM clearance methodology. The Navy has allocated significant resources to the development of improved MCM capabilities that will allow future commanders to quickly overcome operational pauses created by the enemy's deployment of mines.[22] Until these improved systems are fully operational and forward deployed in sufficient numbers to be immediately effective against an adversary deploying a large number of modern mines, a window of vulnerability exists for U.S. naval forces tasked to establish sea superiority within the littorals. During this period, the U.S. Navy must prioritize its assets to optimize its ability to prevent or avoid these threats.

The concepts of prevention and avoidance within MCM doctrine are also relative to the threat provided by the conventional submarine operating within the littorals. The non-snorkeling conventional submarine is a very challenging platform both to detect and track. The difficulties are magnified in the demanding littoral environment. In addition, the Navy does not have a credible USW weapon within the operational inventory for use against a modern diesel submarine operating at very low speeds or on the bottom within the shallow littorals.

In most scenarios, the mine and submarine threats will likely pose the greatest initial challenge to future U.S. Navy sea control operations within the littorals. The anti-ship missile and small craft threats are of significant concern to the U.S. and allied MCM and

[22] A description of several MCM systems in development is included within Appendix A.

USW forces attempting to neutralize the enemy's mines and submarines. Once the enemy's mine and submarine threats are either eliminated or contained, the U.S. Navy's sea control operations must be fully focused on eliminating any remaining anti-ship missile or small craft threats that were not eliminated during the USW and MCM phase of operations.

Intelligence Preparation of the Battlespace

During this period of vulnerability, the United States cannot allow a future adversary to covertly deploy its naval mines or submarines before the start of hostilities. It is imperative that the United States make the best use of its intelligence collection assets. The "stove piping" of individual service and agency intelligence collection efforts must be eliminated. All sources of intelligence must be quickly assimilated in a format that will support efficient, timely analysis. This complex process can be streamlined and made more responsive by fully incorporating information technology (IT) and network-centric concepts. VADM Arthur Cebrowski described network-centric operations as:

"information-intense interactions between computational nodes on the network. Whether these interactions are focused on commerce, education or military operations, there is 'value' that is derived from the content quality and timeliness of information moving between nodes on the network. This value increases as information moves toward 100% relevant content, 100% accuracy and zero time delay – toward information superiority."[23]

To gain the full benefit from a network-centric system, the entire spectrum of available intelligence collection products must be appropriately formatted and channeled into the network. This should incorporate all relevant intelligence sources, including U.S. military and civilian agencies, selected allied nations, and commercial assets. In addition, expert systems should be integrated to consolidate external inputs with organic data, and reduce it all to easily understood parcels of information.

[23] Arthur K. Cebrowski (VADM., USN), "Network-Centric Warfare Its Origin and Future," U.S. Naval Institute Proceedings, January 1998, 31.

In the current environment of reduced defense spending, the Navy must make these advances without the luxury of a large research and development budget. ADM Paul Reason provides his perspective as the Commander in Chief, U.S. Atlantic Fleet:

"Gone are the days when the military led society in technology and organizational ability. The military now has more to learn than it has to teach. It can learn valuable lessons from successful American companies in many areas including: (1) rapid, timely, and economic worldwide distribution of material, information, and services, (2) decentralized management of operations, (3) networking and information management, (4) data collection and analysis, and (5) dynamic incorporation of new and advanced technologies."[24]

The U.S. Navy's willingness to use more commercial off the shelf (COTS) technology products is a clear step in the right direction.

A network-centric intelligence system will clearly provide an improved, real-time tactical intelligence picture to every commander. In addition, the synergistic effects realized through the effective assimilation of all sources of intelligence will provide a vastly improved operational intelligence perspective on an enemy's capabilities and likely intentions. It will allow operational planners to have a far better insight into the enemy's likely courses of action.

Rules of Engagement

The dramatic gains achieved through information technology will be lost if the U.S. Navy fails to plan for the use of preemptive actions that will preclude an enemy from taking local control of the seas. U.S. planners must create a comprehensive list of viable options to eliminate a future enemy's submarine and naval mine threats before the start of hostilities. In this technologically advanced environment, the U.S. cannot afford to be reactive and allow an adversary to strike first. This demands an aggressive position and

[24] J. Paul Reason (ADM., USN), Sailing New Seas, The Newport Papers, no. 13 (Newport, RI: Naval War College, March 1998), 13-14.

the determination to take preemptive action to effectively combat a future adversary's sea denial assets before they can become threats to U.S. and allied naval forces.

Integral to this process is the need to make the National Command Authorities (NCA) and advisors fully cognizant of the staggering implications of allowing an adversary to execute his sea denial plan. They must be ready to authorize the necessary preemptive action to preclude an adversary from deploying its submarines and mines. Clausewitz's perspective for engaging the enemy has value in this context:

"We are not interested in generals who win victories without bloodshed. The fact that slaughter is a horrifying spectacle must make us take war more seriously, but not provide an excuse for gradually blunting our swords in the name of humanity. Sooner or later someone will come along with a sharp sword and hack off our arms."[25]

Although Clausewitz speaks of generals, the intent of his passage has application to leaders at the national strategic level today. Purely diplomacy-based decisions may have the unintended effect of blunting U.S. swords before the battle begins.

In order to have the option to execute these preemptive operations, there must be an adequate number of covert and overt platforms positioned within the theater. They will collectively monitor the enemy's activities, provide critical intelligence to the operational commander, and take the required preemptive actions allowed by their rules of engagement (ROE) to preclude the enemy from establishing sea superiority within an area vital to U.S. interests.

If prevention becomes unachievable either due to diplomatic restrictions or other operational limitations, an operational planning branch must be in place to ensure those threats that the enemy was able to deploy can be avoided by U.S. and allied naval forces. This is not likely to be the preferred option, but it is a far more desirable alternative than having to conduct MCM and USW operations over a poorly defined area prior to any U.S.

[25] Clausewitz, 260.

warships reaching the littorals. Finally, if avoidance is not realistically achievable, the operational commander must decide whether to place his MCM and USW forces at risk and delay the offensive operation, proceed with his entire task force and accept the inherent risk of operating in areas that could be defended by an integrated system, or stop the operation. This final option may not always be available.

CONCLUSIONS

A window of vulnerability exists for those U.S. assets tasked to establish sea superiority against an adversary that possesses a modern, coordinated littoral defense. This vulnerability will remain until the next generation of MCM and littoral USW weapon capabilities become operational and are deployed in sufficient numbers within a theater of operations at the outbreak of hostilities. Therefore, operational plans should lay the foundation for accomplishing successful sea control operations on the prevention and avoidance of an adversary's sea denial assets.

This objective can be realized through improvements within intelligence collection and dissemination. These gains are achievable through the timely incorporation of evolutionary information technology from the corporate sector. The gains acquired through increased network-centric operations must be complemented by operational planning that includes the use of preemptive actions. We cannot afford to absorb the first round of fire prior to taking any action. Since the elimination or prevention of an enemy's sea denial capability cannot be always realistically achieved, an operational branch must be in place to locate the threat with a high degree of assurance and then avoid it.

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APPENDIX A

This appendix provides a brief description of seven organic MCM systems in development: three underwater reconnaissance systems, two airborne mine detection systems, and two airborne mine destruction systems.[26]

I. Underwater Reconnaissance Systems

A. Remote Minehunting System (RMS) is a semisubmersible vehicle designed to be deployed from surface ships and will be capable of locating and neutralizing mines. It will have a communications link that will allow operations out to a range of about 100 nautical miles.

B. Near-Term Mine Reconnaissance System (NMRS) is an unmanned underwater vehicle (UUV) designed to be operated from a Los Angeles class submarine. It is tethered to its host submarine by a fiber-optic cable.

C. Long-Term Mine Reconnaissance System (LMRS) is the follow on system for NMRS. It will have improved endurance and faster search rates.

II. Airborne Mine Detection Systems

A. Improved Airborne Laser Mine Detection System (ALMDS) is the follow on system to Magic Lantern, a blue-green laser with a shallow water detection system.

B. AN/AQS-20/X will provide a significant improvement in fidelity over ALMDS, and will allow detection of mines in deep water, bottom influence mines, and rising warhead mines.

III. Airborne Mine Destruction Systems

A. Rapid Airborne Mine Clearance System (RAMICS) will be used in conjunction with ALMDS. It is a 20mm machine gun used to detonate mines in less than 50 feet of water.

B. Airborne Mine Neutralization System (AMNS) is a remotely operated unmanned underwater vehicle designed to find and destroy deep water mines.

[26] Edward Hanlon Jr. (MGEN., USMC), "Organic Mine Countermeasures," Surface Warfare, May/June 1998, 13-14.